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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/494,589	01/31/2000	ANTHONY R.A. KEANE	C34932/114785	3652

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EXAMINER	
MILORD, MARCEAU	
ART UNIT	**PAPER NUMBER**
2682	7

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No. 09/494,589	Applicant(s) KEANE ET AL.
	Examiner Marceau Milord	Art Unit 2682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1- 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner et al (US Patent No 5939886) in view of Thomas, III et al (US Patent No 5273610) and Mavretic (US Patent No 6046594).

Regarding claims 1- 11, Turner et al discloses an apparatus for measuring the characteristics of radio frequency energy (figs. 1-3) in an industrial radio frequency processing system (col. 3, line 6- col. 4, line 45) comprising: a plurality of generator means (12 of figs. 1 and 5) for generating a plurality of power outputs onto a single transmission means (col. 7, lines 29-54), at a plurality of frequencies, each one of said plurality of outputs having associated characteristics (col. 8, line 30- col. 9, line 40); and common detection means (174 of fig. 12 or 214 of fig. 14) for detecting said associated characteristics of said plurality of outputs, said detection means comprising means for sensing said associated characteristics of a first generated output at a first frequency, alternating to a second frequency (col. 13, line 26- col. 14, line 7).

However, Turner et al does not specifically disclose the features of a common detection means comprising means for sensing said associated characteristics of a first generated output at a first frequency, and sensing said associated characteristics of said second generated output at said second frequency.

On the other hand, Thomas et al, from the same field of endeavor, discloses a current sensor having radiation emitter, such as an electrical resistor and a radiation detector, such as an infrared detector, for sensing current flowing to a plasma-generating electrode from a radio frequency power source. Furthermore, a voltage sensor and a second current sensor, such as a torroidal current sensor, provide the voltage and phase angle of the current delivered to the plasma generating electrode to permit calculation of the power delivered to the plasma generating electrode; a processor controls the RF source responsive to the sensed average current, sensed voltage, and sensed phase angle of the current (fig. 2, fig. 5; col. 2, line 33- col. 3, line 67; col. 5, line 6- col. 6, line 36).

Malvretic also discloses a method and apparatus for measuring electrical characteristics such as current, voltage, phase between a power source and a load at a set of harmonics frequencies to determine information about the load (col. 2, lines 20-39). In addition, Malvretic shows in figure 1 a system 100 which can be used to detect and analyze signals and associated harmonics in a system comprising a power source coupled to a load via a transmission line (col. 3, lines 1-35). Malvretic also shows in figure 2 a system 200 that includes a radio frequency generator 210, which is used to power a load 230. The load can be any number of devices (plasma chamber; col. 3, lines 50- col. 4, line 65).

Since the detecting means can be switched to a second frequency, and the tuning means can also be tuned to any desired frequency, it is obvious to say that any number of tuning means can be used with any number of generating means. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Malvretic

to the modified system of Thomas and Turner in order to allow a single device to measure voltage, current, and phase at more than one frequency.

Regarding claims 12-22, Turner et al discloses a method for measuring characteristics of radio frequency energy (figs. 1-3) delivered in an industrial radio frequency processing system (col. 3, line 6- col. 4, line 45) comprising: generating (12 of figs. 1 and 5) a first power output onto a transmission means at a first frequency (col. 7, lines 29-54), said first power output having associated characteristics (col. 8, line 30- col. 9, line 40); generating a second power output onto said transmission means at a second frequency, said second power output having said associated characteristics (col. 9, line 6- col. 10, line (col. 9, line 6- col. 10, line 56) ;
sensing said associated characteristics on said transmission means at said first frequency; switching to said second frequency (col. 13, line 26- col. 14, line 7).

However, Turner et al does not specifically disclose the step of sensing said associated characteristics on said transmission means at said second frequency using a common sensing means used to sense said first frequency.

On the other hand, Thomas et al, from the same field of endeavor, discloses a current sensor having radiation emitter, such as an electrical resistor and a radiation detector, such as an infrared detector, for sensing current flowing to a plasma-generating electrode from a radio frequency power source. Furthermore, a voltage sensor and a second current sensor, such as a torroidal current sensor, provide the voltage and phase angle of the current delivered to the plasma generating electrode to permit calculation of the power delivered to the plasma generating electrode; a processor controls the RF source responsive to the sensed average

current, sensed voltage, and sensed phase angle of the current (fig. 2, fig. 5; col. 2, line 33- col. 3, line 67; col. 5, line 6- col. 6, line 36).

Malvretic also discloses a method and apparatus for measuring electrical characteristics such as current, voltage, phase between a power source and a load at a set of harmonics frequencies to determine information about the load (col. 2, lines 20-39). In addition, Malvretic shows in figure 1 a system 100 which can be used to detect and analyze signals and associated harmonics in a system comprising a power source coupled to a load via a transmission line (col. 3, lines 1-35). Malvretic also shows in figure 2 a system 200 that includes a radio frequency generator 210, which is used to power a load 230. The load can be any number of devices (plasma chamber; col. 3, lines 50- col. 4, line 65). Since the detecting means can be switched to a second frequency, and the tuning means can also be tuned to any desired frequency, it is obvious to say that any number of tuning means can be used with any number of generating means. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Malvretic to the modified system of Thomas and Turner in order to allow a single device to measure voltage, current, and phase at more than one frequency.

Regarding claims 23-33, Turner et al discloses an apparatus for measuring characteristics of radio frequency energy (figs. 1-3) delivered in an industrial radio frequency processing system (col. 3, line 6- col. 4, line 45) comprising: a plurality of generator means (12 of figs. 1 and 5) for generating a plurality of power outputs onto a single transmission means at a plurality of frequencies (col. 7, lines 29-54), each one of said plurality of outputs having associated characteristics (col. 8, line 30- col. 9, line 40); a plurality of tuning means for tuning to said plurality of frequencies; and common detection means(174 of fig. 12 or 214 of fig. 14) for

selecting one of said plurality of tuning means and detecting said associated characteristics of said plurality of outputs at the frequency of said selected tuning means(col. 13, line 26- col. 14, line 7).

However, Turner et al does not specifically disclose the features of a common detection means for detecting said associated characteristics of said plurality of outputs at the frequency of said selected tuning means.

On the other hand, Thomas et al, from the same field of endeavor, discloses a current sensor having radiation emitter, such as an electrical resistor and a radiation detector, such as an infrared detector, for sensing current flowing to a plasma-generating electrode from a radio frequency power source. Furthermore, a voltage sensor and a second current sensor, such as a torroidal current sensor, provide the voltage and phase angle of the current delivered to the plasma generating electrode to permit calculation of the power delivered to the plasma generating electrode; a processor controls the RF source responsive to the sensed average current, sensed voltage, and sensed phase angle of the current (fig. 2, fig. 5; col. 2, line 33- col. 3, line 67; col. 5, line 6- col. 6, line 36).

Malvretic also discloses a method and apparatus for measuring electrical characteristics such as current, voltage, phase between a power source and a load at a set of harmonics frequencies to determine information about the load (col. 2, lines 20-39). In addition, Malvretic shows in figure 1 a system 100 which can be used to detect and analyze signals and associated harmonics in a system comprising a power source coupled to a load via a transmission line (col. 3, lines 1-35). Malvretic also shows in figure 2 a system 200 that includes a radio frequency generator 210, which is used to power a load 230. The load can be any number of devices

(plasma chamber; col. 3, lines 50- col. 4, line 65). Since the detecting means can be switched to a second frequency, and the tuning means can also be tuned to any desired frequency, it is obvious to say that any number of tuning means can be used with any number of generating means. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Malvretic to the modified system of Thomas and Turner in order to allow a single device to measure voltage, current, and phase at more than one frequency.

Regarding claims 34- 44, Turner et al discloses method for measuring characteristics of radio frequency energy (figs. 1-3) delivered in an industrial radio frequency processing system (col. 3, line 6- col. 4, line 45) comprising: generating (12 of figs. 1 and 5) a first power output onto a transmission means at a first frequency (col. 7, lines 29-54), said first power output having associated characteristics; generating a second power output onto said transmission means at a second frequency, said second power output having said associated characteristics(col. 8, line 30- col. 9, line 40); tuning a first tuning means to said first frequency (col. 9, line 6- col. 10, line 56) ; tuning a second tuning means to said second frequency; selecting one of said tuning means (col. 13, line 26- col. 14, line 7).

However, Turner et al does not specifically disclose the step of sensing said associated characteristics on said transmission means at said frequency associated with said selected tuning means.

On the other hand, Thomas et al, from the same field of endeavor, discloses a current sensor having radiation emitter, such as an electrical resistor and a radiation detector, such as an infrared detector, for sensing current flowing to a plasma-generating electrode from a radio frequency power source. Furthermore, a voltage sensor and a second current sensor, such as a

torroidal current sensor, provide the voltage and phase angle of the current delivered to the plasma generating electrode to permit calculation of the power delivered to the plasma generating electrode; a processor controls the RF source responsive to the sensed average current, sensed voltage, and sensed phase angle of the current (fig. 2, fig. 5; col. 2, line 33- col. 3, line 67; col. 5, line 6- col. 6, line 36).

Malvretic also discloses a method and apparatus for measuring electrical characteristics such as current, voltage, phase between a power source and a load at a set of harmonics frequencies to determine information about the load (col. 2, lines 20-39). In addition, Malvretic shows in figure 1 a system 100 which can be used to detect and analyze signals and associated harmonics in a system comprising a power source coupled to a load via a transmission line (col. 3, lines 1-35). Malvretic also shows in figure 2 a system 200 that includes a radio frequency generator 210, which is used to power a load 230. The load can be any number of devices (plasma chamber; col. 3, lines 50- col. 4, line 65). Since the detecting means can be switched to a second frequency, and the tuning means can also be tuned to any desired frequency, it is obvious to say that any number of tuning means can be used with any number of generating means. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Malvretic to the modified system of Thomas and Turner in order to allow a single device to measure voltage, current, and phase at more than one frequency.

Response to Arguments

2. Applicant's arguments with respect to claims 1-44 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marceau Milord whose telephone number is 703-306-3023. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 703-308-6739. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-305-9508 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

M Milord
MARCEAU MILORD

Marceau Milord
Examiner
Art Unit 2682

June 29, 2003